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OBSERVATIONS ON THE MATING BEHAVIOR  
OF *PSEUDOCOTALPA GIULIANII* HARDY

ALAN R. HARDY

Insect Taxonomy Laboratory  
California Department of Food and Agriculture  
Sacramento, CA 95814

On April 29, 1974, in company with T. D. Eichlin, I had the opportunity to observe an evening's activity of *Pseudocotalpa giulianii* Hardy at Big Dune, Nye County, Nevada.

Throughout the afternoon, scattered individual adults were uncovered at depths of 4 to 6 inches as we sifted the sand beneath Creosote bushes (*Larrea divaricata* Cav.). No adults were active until late afternoon, about 1 hour before dark. Our first indication of activity was the slow flight of solitary individuals hovering near the tips of Creosote plants. First activity was at least 1/2 hour earlier than I have observed for *Pseudocotalpa andrewsi* Hardy and *P. sonora* Hardy. The number of individuals rapidly increased until they could be seen in every direction at the tops of the Creosote bushes.

Females were on the creosote branch tips, where they were evidently emitting a pheromone. The males hovered downwind from the tips of the branches, attempting to locate the female.

Large numbers of males were hovering downwind from branches where no female was present. Evidently there was pheromone on the branches, probably from the previous night (because our observations were made during the earliest minutes of the emergence, when there had probably not been sufficient time for a female to have moved to the plant, mated, and

departed). One such swarm of males was found to contain at least 9 individuals, but most swarms were smaller, usually with 3 to 6 males.

Final location of a female is evidently visual, as no attempt to land on the branches was made by a male unless a female was present. Males investigating branches on which no female was present continued to hover and move gradually back and forth for prolonged periods of time.

The observers could approach from downwind easily to within 2 or 3 feet of the flying males without any change in behavior pattern, whereas approach from upwind resulted in the breakup and dispersal of the swarm while the observers were still 15-20 feet away.

Two matings were observed. The first was at the tip of a creosote branch and lasted for approximately 2 minutes. The male was observed to land on the branch and crawl to the female, mounting her from behind. Upon mounting, the male immediately commenced stroking the prothorax and head of the female with the antennae, simultaneously rubbing the apex of the female's elytra with his hind legs. This lasted for less than a minute, and was immediately followed by a successful attempt at genital insertion. At this point activity ceased, except for a rhythmic pumping of the male's abdomen until withdrawal less than a minute from the time of insertion. The adults then disengaged, and the male began to take wing, at which point the pair was collected.

The second observed mating is perhaps less typical. Several beetles were observed to be rolling in the sand in a ball, after most activity by other adults had ceased. Upon closer examination this ball was found to comprise a male laying on his back on the sand, grasping a female in a mounting position, both insects inverted, the female waving her legs in the air and attempting to right herself. An additional male was crawling over the pair, evidently attempting to find a mating position. This chaotic activity lasted for at least 5 minutes, at which point the extra male wandered off into the approaching darkness and burrowed into the sand. Shortly thereafter, the remaining male successfully attempted genital insertion and copulation occurred in the inverted position. Activity then ceased until withdrawal about a minute later, when the female regained her feet and wandered a few inches and began to burrow into the sand. The male attempted for several more minutes unsuccessfully to regain his feet and was collected.

Intense activity seemed to last for approximately 1/2 hour. As darkness began to fall, the beetles could be found on the surface of the sand, or digging into the sand. Tracks on the surface were easily utilized to find the buried beetle, about 4" deep in the sand. Most of the insects burrowed in the surface of the open dune, away from any vegetation. Until we retired at 11:00 p.m., we could still encounter an occasional beetle on the surface of the sand, usually on its back. However, most beetles had burrowed into the sand by nightfall.

Other observers report (*in litt.*) that in areas lacking creosote bushes on the sand, copulation takes place on the surface.

Random collecting resulted in the capture of 109 males and 14 females, probably a fair estimate of the sex ratio. After collection, 5 females were preserved and sent to P. Ritcher who reports all were gravid.

Indications are that this species is rarely attracted to a fluorescent blacklight.

